

## *Sloetia* (Moraceae): a new generic record for the Philippines

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### Abstract

*Sloetia* is reported as a new generic record for the Philippines. Individuals of *Sloetia elongata* were discovered near the Mt. Hamiguitan Range Wildlife Sanctuary, growing in lowland disturbed areas outside the protected area. A subsequent search of online images and herbarium specimens revealed two previously overlooked records of *S. elongata* from Dinagat, indicating that the species occurs at both the northern and southern extremes of eastern Mindanao. *Sloetia* can be distinguished from other Moraceae by its spicate staminate to bisexual inflorescences with a prominent sterile groove and its free stipules that are nearly fully amplexicaul.

### Introduction

*Sloetia* Teijsm. & Binn. ex Kurz (Moraceae) is a monotypic genus in the mulberry family, and its sole species, *Sloetia elongata* (Miq.) Koord., has been recorded in the Malay Peninsula, Sumatra, Borneo, and Sulawesi (Berg et al. 2006, Clement and Weiblen 2009). Corner (1962) reduced *Sloetia* to a monotypic section of *Streblus*, in the tribe Moreae, a position maintained in the *Flora Malesiana*. However, Clement and Weiblen (2009) reinstated the genus based on phylogenetic evidence that *Sloetia* was not closely related to *Streblus* and belonged to the tribe Dorstenieae. *Sloetia* is morphologically distinct from *Streblus* in having bisexual inflorescences, a character absent from Moreae but found in several other Dorstenieae, such as the closely-related *Bleekrodea*—also a former section of *Streblus* (Clement and Weiblen 2009).

Mt. Hamiguitan Range Wildlife Sanctuary in La Union, San Isidro, Davao Oriental, a UNESCO World Heritage Site and ASEAN Heritage Park, covers 6,834 hectares of habitat with an elevation range of 75–1,637 m (Amoroso and Aspiras 2010, UNESCO 2014). The Sanctuary's diverse of forest types and elevations harbor high levels of biodiversity. Amoroso and Aspiras (2010) documented 163 endemic species, 35 threatened species, and 33 rare species of plants.

In July 2016, DNT and ERT conducted a botanical survey for the FORIS Project, 'Removing Barriers to Invasive Species Management in Production and Protection Forest in Southeast Asia', in the Mt. Hamiguitan Range Wildlife Sanctuary. Several *S. elongata* individuals were observed and collected in quadrats along the old logging road near the Mt. Hamiguitan Natural Science Museum (approximate coordinates (06° 44' 02.8" N, 126° 08' 25.3" E). The FORIS survey also documented other notable plant species endemic to the area around

Mt. Hamiguitan, including *Nepenthes hamiguitanensis* Gronem., Wistuba, V.B. Heinrich, S. McPherson, Mey & V.B. Amoroso, *Nepenthes justinae* Gronem., Wistuba, Mey & V.B. Amoroso, *Nepenthes micramphora* V.B. Heinrich, S. McPherson, Gronem. & V.B. Amoroso, *Nepenthes peltata* Sh. Kurata, *Lindsaea hamiguitanensis* Karger & V.B. Amoroso, *Paphiopedilum adductum* Asher, and two species belonging to the Philippine endemic genus *Greeniopsis* (Rubiaceae), which are new locality records for Mindanao.

The *Sloetia* specimens from Mt. Hamiguitan (Fig. 1, vouchers deposited at PNH) were confirmed by comparison with images and published descriptions as *Sloetia elongata* (Miq.) Koord., a species not previously reported in the Philippines (Merrill 1923, Madulid 2001, Pelser et al. 2011). Subsequently, we searched Moraceae images on Co's Digital Flora of the Philippines (Pelser et al. 2011), hosted on the PhytoImages website (Nickrent et al. 2006), and identified another instance of *S. elongata*—previously identified as a *Broussonetia*—from the Loreto watershed in Dinagat (November 2014, DOL nos. 107769, 107830, 107855, 107859, 107862, 107864, 107878), indicating that the species occurs at both the northern and southern extremes of eastern Mindanao. This finding once again demonstrates the value of online biodiversity records, even without correct identifications. A herbarium search further corroborated this range, revealing a single collection from Loreto in September 1991, PPI 3845 (L, barcode number L.1622997, det. C.C. Berg under the synonym *Streblus elongatus*). These records represent a notable addition to the Philippine flora, as only three of the thirteen genera of Dorsteniaceae have previously been reported in the Philippines (*Broussonetia*, *Fatoua*, and *Malaisia*) (Berg et al. 2006, Pelser et al. 2011).

### Taxonomic discussion

**Identification:** The *Sloetia* specimens examined from Mindanao fit within the description in the *Flora Malesiana* (under the synonym *Streblus elongatus*) (Berg et al. 2006), which is not reproduced here as it is available online through the Naturalis Biodiversity Center's Digital Academic Repository (<http://www.repository.naturalis.nl/document/614214>). Instead, we review characters useful in distinguishing *Sloetia* from allied species (Berg et al. 2006). *Sloetia elongata* may superficially resemble other distichous-leaved Moraceae found in its range, as it has white to cream-colored latex, prominent stipules, and minute flowers. When in flower or fruit, it can be distinguished from all of them by its spicate staminate or bisexual inflorescences with a prominent sterile groove. Sterile individuals can be distinguished by stipules that are almost fully amplexicaul but do not quite meet. Vegetatively, *Sloetia* resembles *Trophis*, *Streblus*, and some species of *Artocarpus* subgenera *Pseudojaca* and *Prainea*, but they all have unisexual inflorescences ( $\pm$  globose in *Artocarpus*) and clearly lateral stipules. *Malaisia scandens*, whose leaves may resemble *Sloetia*, may be distinguished by its climbing habit, unisexual inflorescences, and clearly lateral stipules. While *Bleekrodea*, not yet recorded in the Philippines but present in Borneo, also has bisexual inflorescences, the staminate portion is cymose rather than spicate, the stipules are clearly lateral, and the leaves have a crenate-dentate margin. *Sloetia* also lacks the trinerved base and small glands just above the petiole found on many species of *Ficus*. Fig. 1.

**Phenology in the Philippines:** Based on the three known records for the Philippines, flowering and fruiting have occurred in July (2016), September (1991), and November (2014).

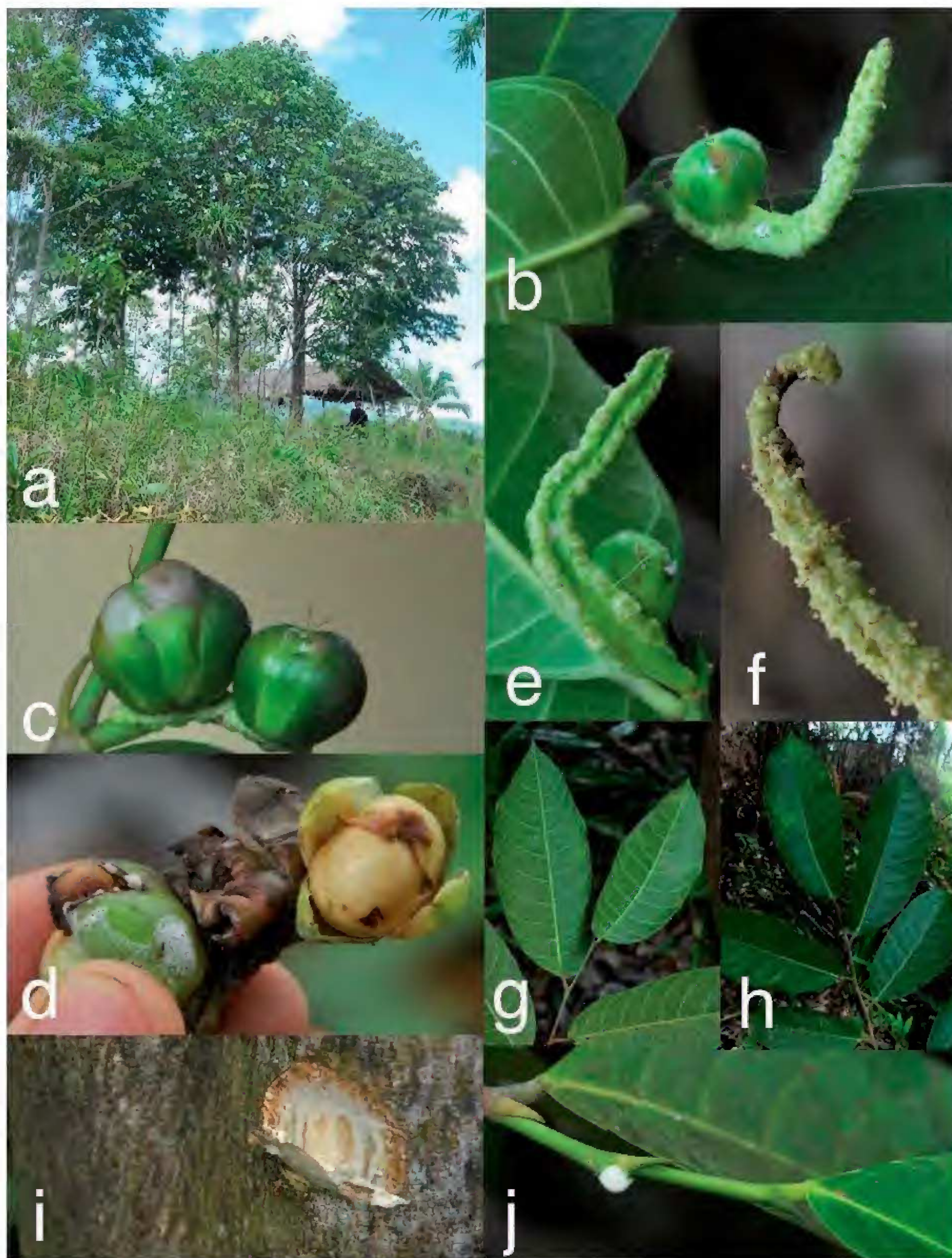
**Distribution** (adapted from Berg et al. 2006): Sumatra (also Riau Archipelago), Malay Peninsula (Penang, Perak, Trengganu to Singapore), Borneo, Sulawesi, and Mindanao (Davao Oriental, Dinagat) (Fig. 2).

**Habitat in the Philippines:** Lowland secondary forests on ultramafic (Davao Oriental) and clay (Dinagat) soils.

**Conservation Status in the Philippines:** Near Mt. Hamiguitan, only a few mature individuals were documented, all outside the protected area. The population may therefore be vulnerable as anthropogenic disturbances have been observed in the area, including road widening for tourism and slash and burn agriculture. Even less is known about the Dinagat population, which is known only from two occurrences collected 20 years apart. Accordingly, due to limited ecological research, there is insufficient information to classify *S. elongata* into any category of threat.

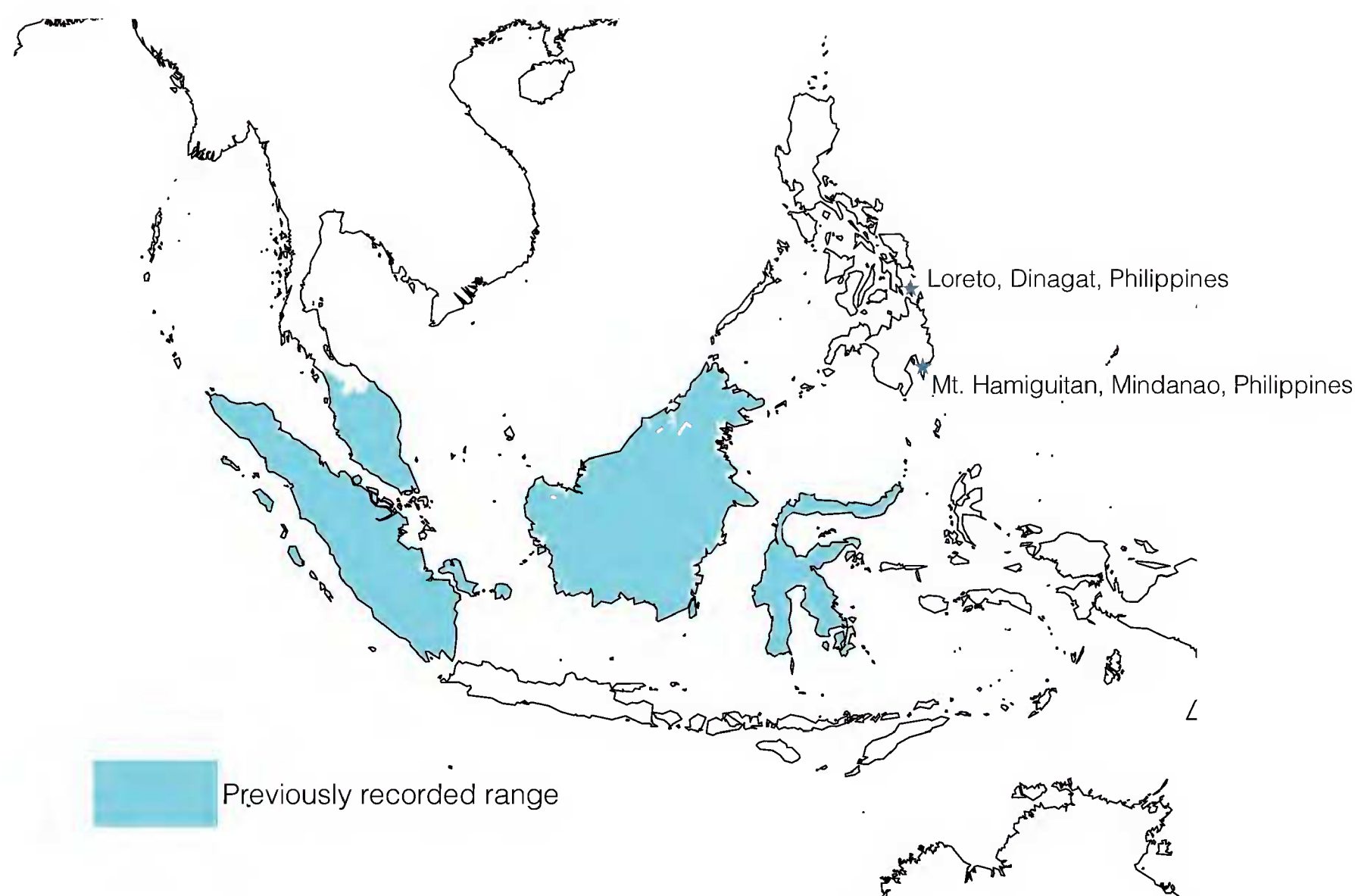
**Specimens examined:** MINDANAO. DAVAO ORIENTAL: San Isidro Municipality, Mt. Hamiguitan Range Wildlife Sanctuary, along old logging road, 06° 44' 01.1" N, 126° 08' 25.5" E, c. 380 masl, 14 Jul 2016, Tandang 1993 & Tadiosa (PNH 255659). SURIGAO DEL NORTE, DINAGAT: Loreto, 29 Sep 1991, Gaerlan, Sagcal, and Fernando PPI 3845 (L.1622997; photo!); Loreto, 10° 21' 6.16" N, 125° 36' 30.21" E, 25 Nov 2014, Pelser & Barcelona s.n. (no voucher; photographs available at phytoimages.siu.edu, DOL nos. 107769, 107830, 107855, 107859, 107862, 107864, 107878).





**Fig. 1.** *Sloetia elongata*: **a.** Two individuals showing plant habit; **b.** bisexual inflorescence and young fruit; **c.** young fruit; **d.** ripe fruit; **e–f.** abaxial (showing sterile groove) and adaxial view of inflorescence; **g–h.** abaxial and adaxial view of leaves; **i.** bark with white latex; **j.** twig with stipule and white latex.





**Fig. 2.** Distribution of *Sloetia elongata* (Miq.) Corner. New records denoted with stars. Map generated with the R packages *rworldmap* (South 2011), *rgeos* (Bivand and Rundel 2016), and *rgdal* (Bivand et al. 2016).

**Systematic note:** The specimens from Mindanao have both inflorescences and leaves toward the lower end of the size range given in descriptions, but there is no morphological basis for supposing that the Philippine material represents a distinct species. However, the broad range of *S. elongata* warrants further study using molecular tools. For example, a recent phylogenetic study found that the subspecies of *Artocarpus nitidus* (Moraceae), a widespread species whose range largely overlaps that of *S. elongata*, were not closely related to one another, despite their extreme morphological similarity (Williams et al. 2017). A broadly sampled study of *S. elongata* could clarify the systematics of this genus, as well as its relationship to the allied genus *Bleekrodea*.

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